WHAT IS CLAIMED IS:

1. A repeater that mediates traffic between a network transceiver and a user transceiver in a wireless communication system comprising:

a network unit that maintains a network link with the network transceiver;

a user unit that maintains a user link with the user transceiver;

a two-way communication pathway between the network unit and the user unit adapted to facilitate signal communication between the network transceiver and the user transceiver in autonomous repeater hops between the network transceiver and the network unit, between the user transceiver and the user unit, and between the network unit and the user unit; and

beam-formers respectively coupled to the network unit and the user unit and adapted to communicate signals in an operating frequency band of the network and user transceivers and to control effective radiated power.

2. The repeater according to Claim 1 wherein:

the beam-formers are adapted to control effective radiated power to increase coverage area of the user unit.

3. The repeater according to Claim 1 wherein:

the beam-formers are adapted to control effective radiated power to improve link quality of the network unit.

4. The repeater according to Claim 1 further comprising:

transmit antennas coupled to the beam-formers whereby the transmit antennas operate at the network and user transceiver operating frequency and the beam-formers control effective radiated power of the network unit and user unit to increase coverage area of the user unit.

5. The repeater according to Claim 1 further comprising:

receiver antennas respectively coupled to the beam-formers whereby the receiver antennas operate at the network and user transceiver operating frequency and the beam-formers control antenna radiation patterns of the network unit and user unit to increase coverage area of the user unit.

6. The repeater according to Claim 1 wherein:

the autonomous repeater hop between the network unit and the user unit is tuned to operate at a frequency band selected from a group consisting of an Unlicensed National Information Infrastructure (U-NII) spectrum frequency band, an

Unlicensed Personal Communication Services (U-PCS) spectrum frequency band, an Industrial, Scientific and Medical (ISM) spectrum frequency band, and any unlicensed frequency band.

7. The repeater according to Claim 1 further comprising:
a gain controller that compensates for propagation losses between the network unit and user unit alone.

8. The repeater according to Claim 1 further comprising:
a gain controller that compensates at least for propagation losses between the network unit and user unit alone.

9. The repeater according to Claim 1 further comprising:
the network unit configured to be placed exterior to a structure;
the user unit configured to be placed interior to the structure; and
a gain controller that compensates for indoor-outdoor propagation losses alone.

10. The repeater according to Claim 1 wherein:
the autonomous repeater hop between the network unit and the user unit on the communication pathway communicates on a carrier signal that is independent of signals communicated between the repeater and the network and user transceivers.

11. The repeater according to Claim 1 wherein:
the autonomous repeater hop between the network unit and the user unit on the communication pathway communicates at a carrier frequency that is independent of signals communicated between the repeater and the network and user transceivers.

12. The repeater according to Claim 1 wherein:
the autonomous repeater hop between the network unit and the user unit on the communication pathway communicates with a signal waveform that is independent of signal waveform communicated between the repeater and the network and user transceivers.

13. The repeater according to Claim 1 further comprising:
dedicated wireless data and/or control links in the communication pathway between the network unit and the user unit operating at unlicensed frequency bands.

14. The repeater according to Claim 1 further comprising:

dedicated wireless proprietary data and/or control links in the communication pathway between the network unit and the user unit operating at unlicensed frequency bands..

15. The repeater according to Claim 1 further comprising:

dedicated wireless data and/or control links in the communication pathway between the network unit and the user unit based on a wireless standard.

16. The repeater according to Claim 1 further comprising:

dedicated wireless data and/or control links in the communication pathway between the network unit and the user unit that are power-controlled for operation at reduced transmit power.

17. The repeater according to Claim 1 further comprising:

dedicated wire-line data and/or control links in the communication pathway between the network unit and the user unit selected from among links in a group consisting of electric wires, telephone lines, and coaxial cables.

18. The repeater according to Claim 1 further comprising:

dedicated wire-line data and/or control links in the communication pathway between the network unit and the user unit based on a wireline standard.

19. The repeater according to Claim 1 further comprising:

an in-band or out-of-band control link in the communication pathway between the network unit and the user unit.

20. The repeater according to Claim 1 further comprising:

a wireless control link in the communication pathway between the network unit and the user unit selected from among a group consisting of Bluetooth, any 802.11-based standard, and other wireless standards.

21. The repeater according to Claim 1 further comprising:

a dedicated wireless or Wire-line proprietary control link in the communication pathway between the network unit and the user unit based on frequency tones.

22. The repeater according to Claim 1 wherein the network unit and/or the user unit further comprises:

a pair of antennas; and

a switch connected to the antenna pair that performs switching operations for transmit/receive operations enabling switched antenna diversity in all or some repeater hops and communication links.

23. The repeater according to Claim 1 further comprising:
local oscillators in the network unit and the user unit; and
a control and/or data link in the communication pathway from the network unit to the user unit that carries a synchronization signal to mutually synchronize the local oscillators.

24. The repeater according to Claim 1 further comprising:
local oscillators in the network unit and the user unit that are synchronized using mains electricity signal oscillations to mutually synchronize the local oscillators.

25. The repeater according to Claim 1 wherein:
the network unit and the user unit are assigned unique identification numbers.

26. The repeater according to Claim 1 further comprising:
an identification and reference frequency unit that generates a Binary Phase Shift Keying (BPSK) signal modulated by the identification number, modulates the signal at a suitable part of the operating unlicensed spectrum band, and couples the signal into a transmitter pathway of a forward-link of the network unit.

27. The repeater according to Claim 1 further comprising:
an identification and location unit that modulates identification and location information on a reverse link communication waveform by coded low bit-rate modulation, the modulation being amplitude modulation or Differential Quadrature Phase Shift Keying (DQPSK) modulation.

28. The repeater according to Claim 1 further comprising:
a calibration signal generator/transmitter that generates a spread-spectrum signal for complex channel impulse response generation.

29. The repeater according to Claim 1 further comprising:
a calibration signal generator/transmitter that generates a spread-spectrum signal for complex channel impulse response generation using a code generation technique selected from one or more techniques from among a group consisting of:
generating spread-spectrum waveforms by Pseudo Random, Gold, or other code known a priori to all units;

generating code phase of a known code to uniquely-identify all user units and all network units;

allocating codes or code phases by dynamic assignment strategies;

using more than one code for complex channel impulse response generation;

using more than one code phase for complex channel impulse response generation;

modulating the spread-spectrum signal by unit identifier; and

generating the spread-spectrum wave frequency in the operating cellular band or in an unlicensed band.

30. The repeater according to Claim 29 wherein:

the calibration signal generator/transmitter that generates the complex channel impulse response using correlation.

31. The repeater according to Claim 29 wherein:

the calibration signal generator/transmitter that generates the complex channel impulse response using matrix inversion.

32. The repeater according to Claim 1 further comprising:

a calibration signal generator/transmitter that generates a complex channel impulse response using correlation.

33. The repeater according to Claim 1 further comprising:

a calibration signal generator/transmitter that generates a complex channel impulse response using matrix inversion.

34. The repeater according to Claim 1 further comprising:

at least one amplifier that boosts a desired signal entering the repeater in part or all of an allocated signal spectrum.

35. The repeater according to Claim 1 further comprising:

the communication pathway between the network unit and the user unit has an operating band that is determined using a technique selected from one or more of a group consisting of preselecting the operating band, manually selecting the operating band, and automatically selecting the operating band based on detected signals.

36. The repeater according to Claim 1 further comprising:

at least one amplifier that boosts a desired signal entering the repeater whereby the signal is from wireless systems selected from one or more of a group consisting of

Global System for Mobile Communications (GSM) and all it's derivative systems, cdma2000 (Code Division Multiple Access), Wideband Code Division Multiple Access (WCDMA), and any other standards, and systems operating in cellular or wireless bands, as well as Global Positioning System (GPS).

37. The repeater according to Claim 1 further comprising:
directional antennas capable of mutual isolation of the network unit and the user unit operating in the boosted signal frequency band.

38. The repeater according to Claim 1 further comprising:
an echo canceller in each of the network and the user units, which mutually isolates the network unit and the user unit and operates in a frequency band of a boosted signal .

39. The repeater according to Claim 1 further comprising:
an echo canceller in each of the network and the user units, which inserts a delay in boosted signals path.

40. The repeater according to Claim 1 further comprising:
an echo canceller in each of the network and the user units, that insert a delay in signal path, the delay being selected from a group consisting of a deliberate delay in the network unit, a deliberate delay in the user unit, and a deliberate delay in both the network unit and the user unit.

41. The repeater according to Claim 1 wherein:
a reverse-link pathway in the communication pathway between the network unit and the user unit, and the reverse-link between the network unit and the network transceiver are gated based on signal presence to reduce interference and power consumption.

42. The repeater according to Claim 1 wherein:
the network unit is configured to operate with a plurality of user units.

43. The repeater according to Claim 1 wherein:
the network unit and user unit are attached and configured mechanically back-to-back in a single housing.

44. The repeater according to Claim 1 wherein:

the repeater operates in an unlicensed frequency band and is capable of selecting an operating band at a frequency that does not interfere with other devices operating in the unlicensed frequency band.